

ABSTRACT OF THE DISCLOSURE

A method of planarizing wafers using shallow trench isolation is described. The method uses a very hard polishing pad and chemical mechanical polishing with no additional etching required. Trenches are formed in a substrate and filled with a trench dielectric, such as silicon dioxide deposited using high density plasma chemical vapor deposition. A layer of resist is then formed on the layer of trench dielectric. The wafer is then planarized using chemical mechanical polishing and a polishing pad having a hardness of at least Shore "D" 52. The hard polishing pad avoids scratch marks on the trench dielectric, the substrate surface, or any other materials deposited on the substrate surface.